Education and Public Participation

Value to the Science Community and Vice Versa

CERES SCIENCE TEAM MEETING
APRIL 26TH-28TH, 2016
NASA LANGLEY RESEARCH CENTER

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CERES Education and Communication

Science Communications and Education

Education Team

Lin Chambers, Lead
Ann Martin, Evaluator

Focus: CAN Award Education Components

NASA Champion: Lin Chambers

S'COOL/GLOBE Integration
Sarah McCrea
Support: Tina Rogerson

NASA Champion: Jessica Taylor/Lin Chambers/Margaret Pippin

GLOBE at Langley
Tina Harte
Support: Preston Lewis, Sarah McCrea

NASA Champion: Lin Chambers

MY NASA DATA
Preston Lewis
Support: Tina Harte, Daniel Oostra, Penny Oots

Continuing Mission Related Education Support

CERES
Lin Chambers

CALIPSO
Jessica Taylor

SAGE III on ISS
Kristyn Damadeo

TEMPO
Margaret Pippin

DISCOVER/KORUS-AQ
Amber Richards
Lin Chambers

** Additional Support from Translators Personnel (Camelia Dellar) and ASDC Personnel*

Communications Team

Denise Lineberry

Aimee Amin
Jim Closs
Jay Madigan
Tim Marvel

Changes in the NASA Education and Communication Model

- Starting in 2015, Missions are no longer required to set aside 1% of funding for mission-specific education efforts
- Instead, Cooperative Agreements for **thematic** educational **content** and activities were awarded in late 2015.
- Missions can still set aside funds for communications or fund additional education as needed.
- Full SMD Education awardee list: http://www.nasa.gov/feature/list-of-science-education-partners-for-nasa-stem-agreements

Slide Credit: Jessica Taylor and Dr. Todd Ellis, CALIPSO Science team Meeting 2016

What Continues under New Plan?

- **Communications**
  - Earth Right Now
  - Earth Observatory
  - Science Visualization Studio
- **Education**
  - Funded Projects from 2015 CAN Awards
  - The GLOBE Program
  - MY NASA DATA
  - S'COOL
  - Office of Education Efforts: NIFS, Educator Professional Development, STEM Engagement activities, and Outreach Events

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New Communication Priorities

NASA Communications

Agency Communications Priorities

Earth Right Now. *Your planet is changing. We're on it. #EarthRightNow*
NASA's fleet of satellites, its airborne missions and researchers address some of the critical challenges facing our planet today and in the future: climate change, sea level rise, freshwater resources, and extreme weather events.

ISS. *Off the Earth, for the Earth. #ISS*
The International Space Station is a blueprint for global cooperation and scientific advancements, a destination for growing a commercial marketplace in low-Earth orbit, and a test bed for demonstrating new technologies. The space station is the springboard to NASA's next great leap in exploration, including future missions to an asteroid and Mars.

Mars. *Join us on the journey. #JourneytoMars*
We are on a journey to Mars. Today our robotic scientific explorers are blazing the trail. Together, humans and robotics will pioneer the next giant leap in exploration.

Technology. *Technology drives exploration. #NASATech*
We develop, test and fly transformative capabilities and cutting edge exploration technologies. Our technology development provides the onramp for new ideas, maturing them from early stage through flight and giving wings to the innovation economy.

Aeronautics. *NASA is with you when you fly. #FlyNASA*
Every U.S. aircraft and air traffic control tower uses NASA-developed technology. We're committed to transforming aviation by reducing its environmental impact, maintaining safety, and revolutionizing aircraft shapes and propulsion.

Solar System and Beyond. *NASA: We're Out There. #NASABeyond*
NASA's exploration spans the universe. Observing the sun and its effects on Earth. Delving deep into our solar system. Looking beyond to worlds around other stars. Probing the mysterious structures and origins of our universe. Everywhere imaginable, NASA is out there.

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Science Directorate Education Scope

Focus on providing many opportunities to involve educators (formal/informal), reaching students and the citizen science community, in real world science.

The SD EPO Team…

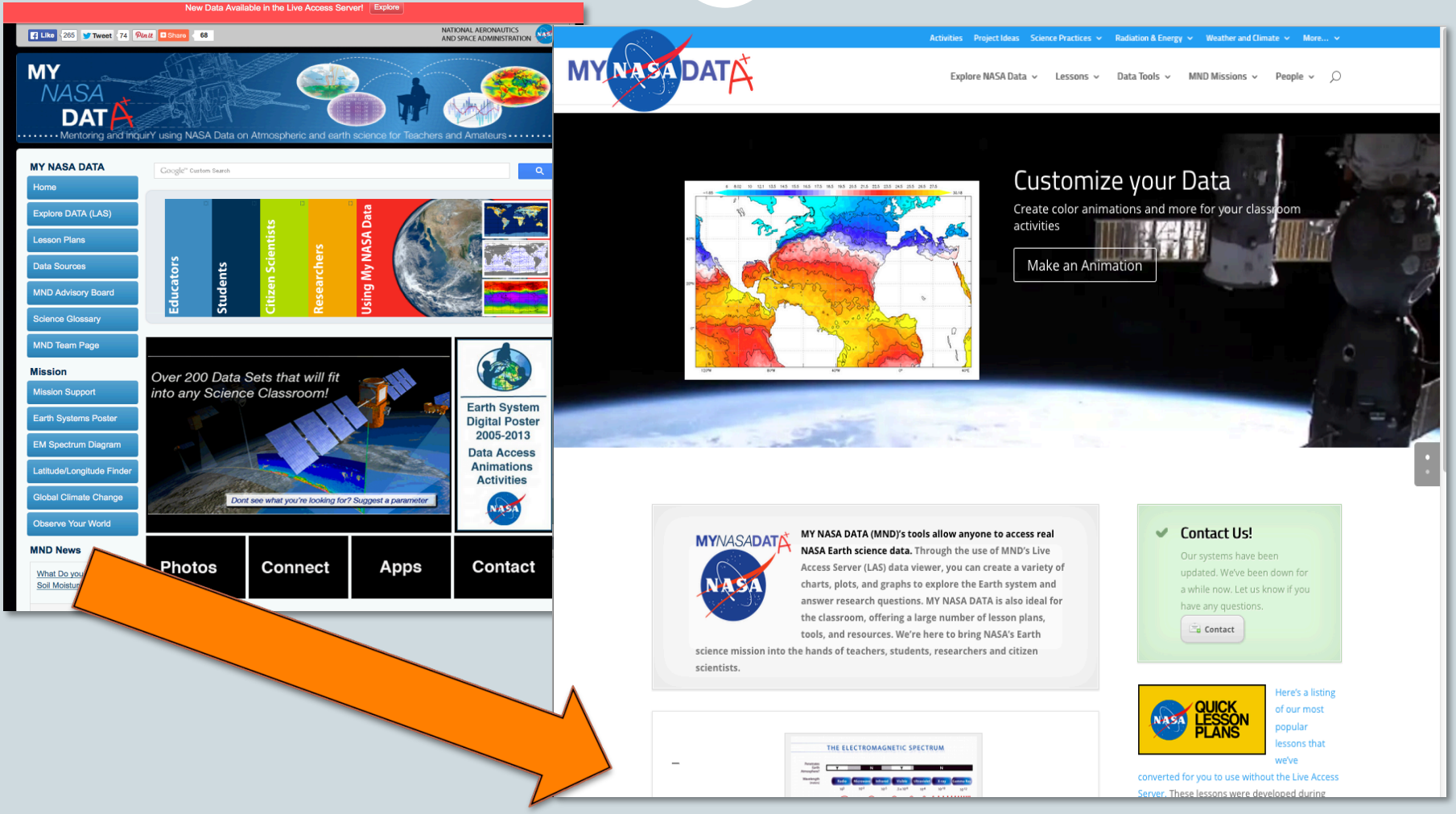
- Collaborates with the education community to bring authentic Earth science practices and real-world data into the classroom.
- Provides Learners with unique NASA experiences, engaging activities, and advanced technology.
- Provides products developed and reviewed by science and education experts.

Our goals include inspiring the next generation of Science, Technology, Engineering and Mathematics (STEM) professionals and improving STEM literacy by providing innovative participation pathways for educators, formal and informal, to reach students and the public.

CERES, Engaging Educators, Students and Public Learners for the past 19 years

If you don't collect a data point now, you will never be able to collect it again

MY NASA DATA Over the Year



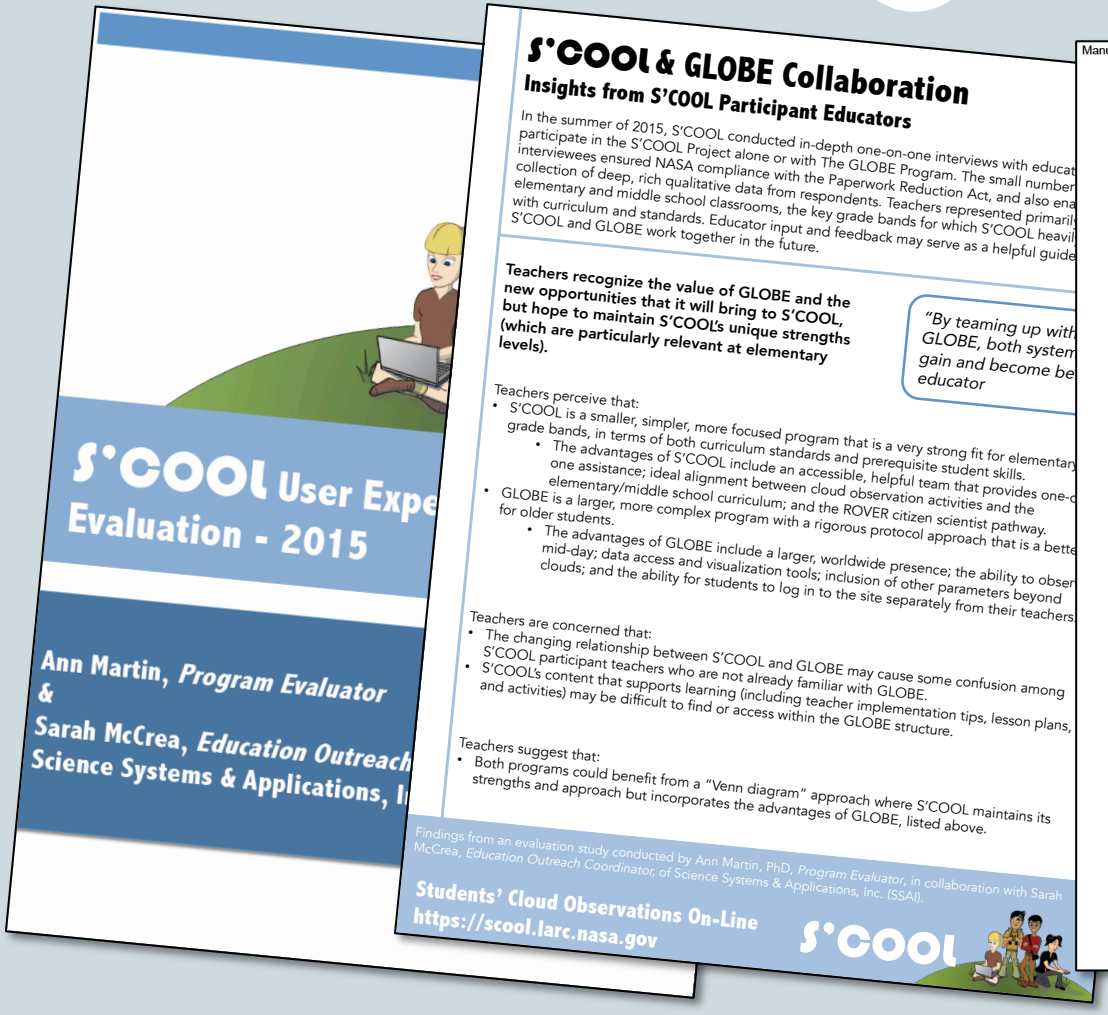
MY NASA DATA What's Next

Moving Forward…

- NESEC asset for multiple applications to get NSAS Earth Science into the hands of Educators and Students.
- Collaboration with Intel ISEF and the Creation of the NASA Earth System Science Award Criteria
- Mission Earth partnership, vertically integrating NASA assets and resources across grade band and developing an effective educator professional development model.

Students' Cloud Observations On-Line (S'COOL) Over the Year

10

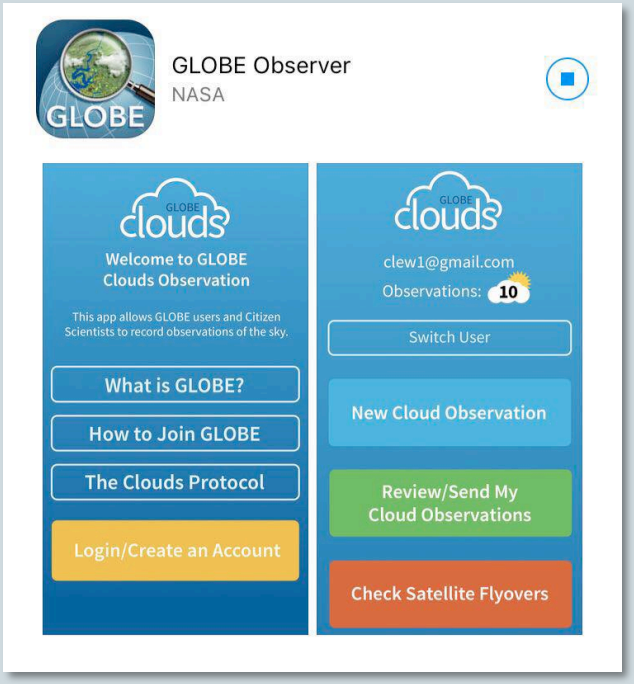


Students' Cloud Observations On-Line (S'COOL) What's Next

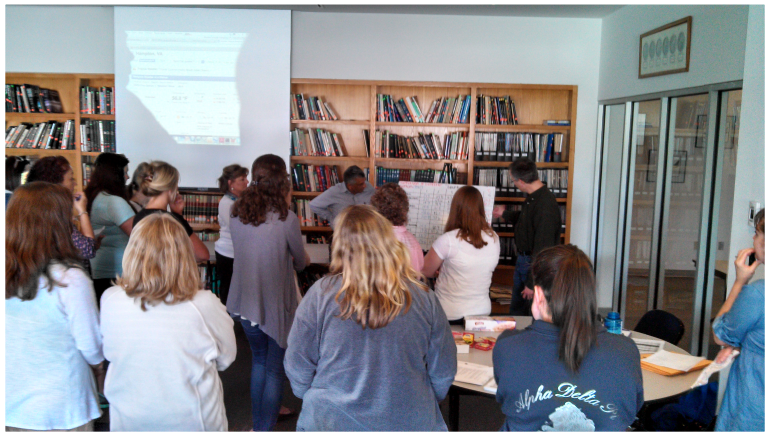
Moving Forward…

- S'COOL integration into the GLOBE Program
  - Formal application: Updated Cloud Observation Protocol, NEW hard copy materials, training slides, online data input, communication to internal and external GLOBE community, training opportunities around NEW cloud protocol
  - Informal application: Clouds is the first protocol translated to the GLOBE Observer APP, designed to extend GLOBES audience and participation

- Mission Earth partnership, vertically integrating NASA assets and resources across grade band and developing an effective educator professional development model.



CERES, Engaging Educators, Students and Public Learners for the past 19 years



You can Observer

You can Analyze

You can Be A Scientist

The Value of Science

There is value in Science/Science Community Participation in Education and Public Engagement!

CERES, Engaging Educators, Students and Public Learners for the past 19 years

- Research shows that students benefit greatly from being involved in scientific inquiry, because they model the actual scientific process and they are more engaged in the learning environment.
- Students learn how to collect data, interpret data, analyze data, think about the data and what might have affected the data, and present their data

Slide Credit: Jessica Taylor and Dr. Todd Ellis, CALIPSO Science team Meeting 2016

Science Communication

- **Why should you care about being a good science communicator?**
  - Advancement of Science (Audience: Scientists)
  - $$$ (Audience: Scientists and Science Leadership)
  - $$$ (Audience: Congress & the Public)
  - Inspiring Other to Care about Science (Audience: Public & Students)

Slide Credit: Jessica Taylor and Dr. Todd Ellis, CALIPSO Science team Meeting 2016

What's Next Knowing Your Audience

- We often are asked to give public talks, but if you've done these, you know that it's very different than a science team talk

- We are available as a resource to help you tailor your talk for your audience, and to hone your message points

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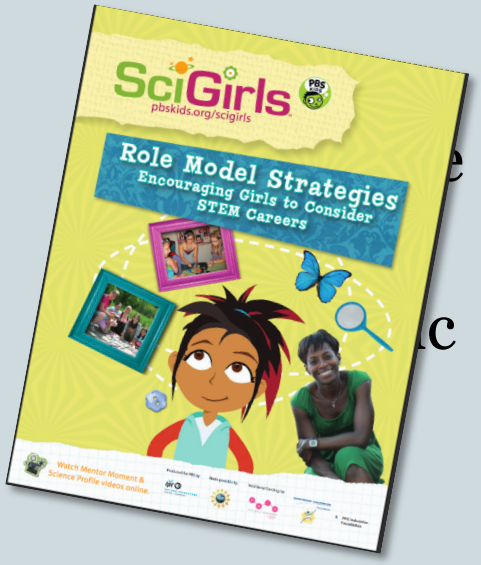
Knowing Your Audience

- Communicating your science is *your* responsibility
- Think about the take away first. Imagine that your audience asks "So What?" at the end, and design your talk backwards from there
- Tell a story: Think about the character, setting, conflict, plot, theme http://users.aber.ac.uk/jpm/ellsa/ellsa_elements.html
- Don't use jargon
- Share challenges and rewards
- Talk about your career path: Working hard and growth, team work, valuable courses, when did you "know" what you wanted to do, are there opportunities for internships

Slide Credit: Jessica Taylor and Dr. Todd Ellis, CALIPSO Science team Meeting 2016

Knowing Your Audience and STEM Engagement

1. Make personal connections to dispel stereotypes.
2. Use positive messaging to show how STEM makes the world a better place.
3. Share your passion.
4. Make it hands-on and interactive.
5. Foster a growth mindset and perseverance
6. Show the way: offer resources and guidance.
7. Follow-up and invite feedback.



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Knowing Your Audience: Education

- Many schools in the U.S. are adopting or considering the Framework for K-12 Science Education (which underpins the Next Gen Science Standards)
- One aspect of this framework is the Process of Science

Science & Engineering Practices for K-12
1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

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Knowing Your Audience: Education

- It is important to share your process:
  - How did you decide to study this question?
  - How did you figure out this was a testable hypothesis?
  - When did you decide you knew something worth sharing with others?
  - What did presenting your research/feedback from others tell you about your results?

Science & Engineering Practices for K-12
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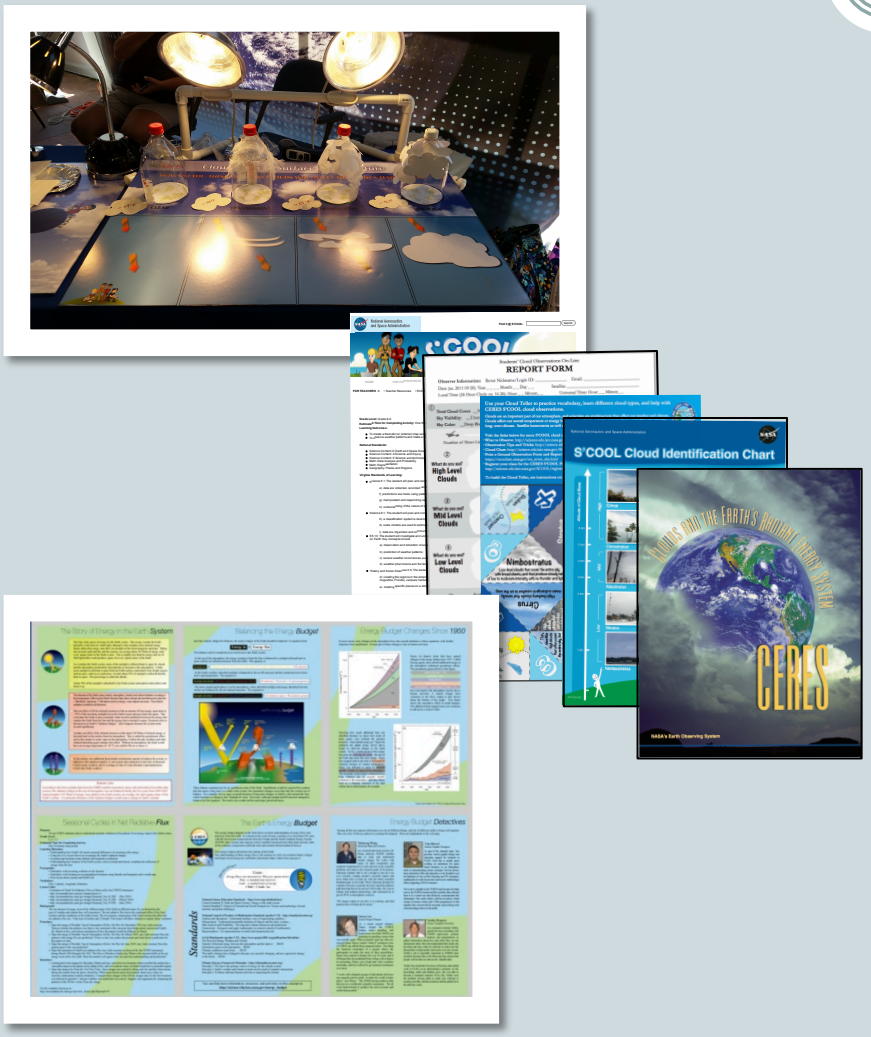
Resources



- OASIS Resources Catalog or contact the SD Education team:
  - Hardcopy Handouts
  - Activity Kits
  - Table Demonstrations
  - Presentation Content
  - Web resources

How You Can Share Your Science Story!

Why is observing, studying, and monitoring clouds important?

How You Can Share Your Science Story!

- Collaborate with the SD Education Team throughout the year
  - GLOBE Integration Home Page Videos
  - NWA Conference 9/2016, Weather Fest and Technical Talks
  - Professional Development
  - Research
  - Etc…

Thank YOU!

We are here to help support your efforts!
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